Claims

Sub A1

1. A method of producing a plant which shows resistance to a herbicide, said method comprising

(i) applying said herbicide to a population of herbicide resistant plants at an advanced vegetative stage before flowering,

(ii) using pollen from said plants to fertilise female plants; and

(iii) obtaining progeny therefrom.

2. A method according to claim 1 wherein the herbicide resistant plants are glyphosate resistant, and the herbicide applied in stage (i) is glyphosate.

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3. A method according to claim 1 wherein the plants comprise crop plants.

4. A method according to claim 3 wherein the crop plants comprise corn.

5. A method according to claim 4 wherein in step (i), the herbicide is applied at the V5 stage of growth or later.

6. A method according to claim 1 wherein the progeny comprise herbicide resistant hybrid seed.

7. A method according to claim 1 wherein the plants contain a further desired transgene.

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8. A method according to claim 7 wherein the further transgene is a gene which encodes a quality trait which is deliverable by a pollinator.

9. A method according to claim 8 wherein the quality trait comprises a high oil system.

10. A method according to claim 7 wherein the transgene is a fertility/sterility controlling gene.

11. A method according to claim 10 wherein said fertility/sterility controlling gene is a male sterility gene.

12. In the production of herbicide resistant hybrid seed, a method of reducing the numbers of herbicide susceptible offtypes in a population of herbicide resistant hybrids, said method comprising spraying male parent plants with said herbicide at an advanced vegetative stage of growth such that any heterozygotes amongst the population will produce pollen which show herbicide resistance as the dominant trait.

13. Hybrid seed obtained by the method of claim 12.

14. A method of producing plants which are reversibly male sterile, said method comprising
(i) transforming a plant with a construct which comprises a male gametophyte killer gene (S) and a herbicide resistance gene (R),
(ii) selecting a transformant which is heterozygous with respect to said genes of structure RSrs, and either
(iii) either (a) where male sterile plants are required, applying herbicide to plants grown from said transformants at an advanced vegetative stage so as to disable residual fertile pollen therein, or
(b) where male fertile plants are required, growing said plants in the absence of herbicide at the advanced growth stage.

15. A method according to claim 14 wherein the selection at stage (ii) is carried out by applying herbicide at an early growth stage.

16. A transgenic plant or seed obtained by the method of claim 14.

17. A method of transforming a plant with a desired transgene, said method comprising

(i) transforming plant cells with:

(a) a construct which comprises a desired transgene;

(b) a herbicide resistance gene;

(ii) growing plants from said cells;

(iii) applying herbicide to plants grown in step (b) at an advanced vegetative stage so as to eliminate any non-transformed plants and to ensure that the pollen produced from surviving plants carries herbicide resistance and the desired trait in a dominant form;

(iv) using pollen produced in step (iii) to fertilise a female parent, and

(v) obtaining the progeny thereof.

18. A plant or seed obtained by the method of claim 17.

19. A method of producing a transgenic plant which demonstrates a desired trait, which method comprises crossing to a female plant which lacks the desired trait, with pollen obtained from a male plant which is heterozygous for said desired trait and also for a herbicide resistance, and applying herbicide to the progeny at an advanced stage of vegetative growth in order to ensure that the trait and herbicide resistance are dominant in the pollen.

20. A plant or seed which is produced by a method according to claim 19.

Abstract

A method of producing a plant which shows resistance to a herbicide in particular glyphosate, said method comprising

(i) applying said herbicide to a population of herbicide resistant plants at an advanced vegetative stage before flowering,

(ii) using pollen from said plants to fertilise female plants; and

(iii) obtaining progeny therefrom.

This method can be used in various ways, including in the production of pure hybrids, as a "switching" system in particular for sterility/fertility in plants and in the production of transgenic plants generally.